

Tackling the agricultural trade costs by implementing the World Trade Organization trade facilitation measures in Pakistan

Shabana Noureen^a & Zafar Mahmood^b

^a Ph.D. scholar in the Department of Economics, School of Social Sciences and Humanities (S3H), National University of Sciences and Technology (NUST), Islamabad, Pakistan.

E-mail: shabana-noureen@s3h.nust.edu.pk

^b Professor of Economics, School of Social Sciences and Humanities (S3H), National University of Sciences and Technology (NUST), Islamabad, Sector H-12, Pakistan.

E-mail: dr.zafar@s3h.nust.edu.pk

DOI: <https://doi.org/10.19275/RSEPCONFERENCES156>

Abstract

The Pakistan economy has enormous potential for increasing its exports via improved competitiveness at the sectoral level. At present, this potential remains untapped due to the presence of high trade costs imposed by trade policy barriers. Thus, to understand the relationship between exports growth and trade costs, this research begins by examining the trends in total trade costs faced by traders in Pakistan. In addition, it specifically ranks order the trade policy barriers (tariff and non-tariff) that generate higher trade costs, for the years 2003 to 2019. Worldwide estimates show that trade costs of the agriculture sector have a diminishing trend. Regarding Pakistan, it remains relatively high but with a slowly declining trend in comparison to major developed and regional trading partner countries. The results in this paper indicate that the trade costs of the agriculture sector are higher. The findings also confirm the existence of relatively higher trade costs on account of non-tariff barriers as compared to trade costs due to tariffs in this sector. Furthermore, Pakistan's trade cost owing to tariffs remains higher with its regional trading partners in this sector, which is one of the main factors adversely affecting competitiveness and hence growth in exports. Furthermore, this research also measures the impact of policy implementation of trade facilitation, in reducing the costs of trade for agricultural sector, particularly those related to non-tariff barriers. Regressions results of cross-sectional fixed effects represent that by fully executing World Trade Organization Trade Facilitation Agreement (WTO-TFA), Pakistan and regional trading partner countries, have hugely decreased trade costs for agricultural goods. These outcomes indicate the policymakers need to put more effort into reducing trade costs, by fully implementing the WTO-TFA at the sectoral level to realize high export growth.

Keywords: agricultural trade costs, trade policy, tariff obstacles, non-tariff barriers.

Jel Codes: F13, F1, F10

1. Introduction

Developing economies have agriculture as the leading sector, where more than half of the population is employed or gets their income from. The contribution of agriculture sector to gross domestic product (GDP) is greater than that of other sectors. In this regard, developing countries have a large potential and comparative advantage to export agriculture goods in global export market. However, the flow of trade of agricultural goods is more from developed to emerging countries, mainly in food commodities, especially vegetables (WITS, 2019)¹.

According to theories of international trade, higher trade costs² for this sector could be one main reason as to why the trade potential of agricultural goods is being lost in developing countries (Hummels, 2007). These higher costs of trade in developing countries impede the potential of trade of agricultural commodities (Mahmood, *et al.* 2017). The carriage of agricultural goods across markets is more costly owing to three qualities. Firstly, at the border these required fast handling, and during the transit needed cold storage amenities because of their heat-sensitive and perishable nature. Secondly, the explicit effect on safety measures and food security of the agricultural sector requires more efficient and effective infrastructure at the border (Fang and Beghin, 2017; Stone and Casalini, 2020). Thirdly, agricultural goods incur almost 15 percent more costs during the transaction due to the inefficiency of administrative procedures of trade (Engman, 2005).

¹ WITS. World Integrated Trade Solution (WITS) 2019. It is available at: <https://wits.worldbank.org/>

² Trade costs includes all costs incurred by producers from the production of commodities to moving the goods to its final users.

However, the research for the effects of policy obstacles and facilitation of trade on agricultural costs of trade is scant. To recognize where the prospective restrictions and what trade facilitation can reduce these costs, a comprehensive study of agricultural trade costs is crucial. This research will contribute to empirical literature by providing detailed analysis of sectoral level trade costs. Additionally, it empirically estimates the effects of fully application of WTO-TFA rates in reducing agricultural costs of trade. Furthermore, it analyzes trends of agricultural trade costs on yearly basis for the collective global economy, and for different developed and developing countries. Results indicate that agricultural trade costs in comparison of the world and developed countries remain high for developing countries, particularly in Pakistan. It remained high on average, with tariff equivalent of 367 percent, but since 2015 Pakistan is experiencing a gradually declining trend. The presence of such a high trade cost confirms the existence of larger trade policy barriers (domestic and foreign) that are biased against agriculture sector. It serves to increase the relative isolation of developing countries from the world market. Therefore, developing countries need to reduce these costs by fully implementing the WTO-TFA more specifically in the agriculture sector.

This study also aims to assess the role of policy barriers (tariff and non-tariff) for defining agricultural trade costs and their changing trends. Results represent that tariff trade costs on agricultural commodities are higher in Pakistan. Despite trade liberalization, Pakistan managed to reduce tariff trade costs in the agriculture sector only marginally. Pakistan's exports of agricultural commodities face relatively higher costs of tariff barriers, particularly in comparison to regional competitors. Non-tariff barrier trade costs compared with tariff barrier trade costs play a more restrictive role in affecting exports of agricultural goods. Noureen and Mahmood (2022) found that non-tariff barriers related trade costs account for 50 to 70 percent of total trade costs in developing countries. In the case of Pakistan, this research found the increasing trend of bilateral trade costs of NTBs for the agriculture sector. In addition, it remains high with the developed partner countries, and with China than other regional trading partner countries. Results indicate that the major cause of higher trade costs in agricultural sector of Pakistan, is the costs of time requirement owing to procedural delays at the border. The higher costs of transporting goods to the border at each step of the trade procedures indicate that agricultural goods were facing greater costs, in the case of Pakistan.

The trade facilitation has played a crucial role in declining time costs particularly at border for agricultural commodities. In 2013, member countries of WTO implemented TFA, in Bali at the occasion of parliamentary conference. One of the main reasons behind lower transportation trade costs at the border for upper-middle and high income of WTO member countries is the effective implementation of TFA. ESCAP (2018) also indicates that modernizing the trade procedures by full implementation of WTO-TFA, is associated 15 percent decline in trade costs in Asia-Pacific. The WTO-TFA and digital trade facilitation are supposed to decrease transportation costs of trade at the border greater than 25 percent of upper-middle and high-income countries. This research estimates the effect of the implementation of WTO-TFA on trade costs of both the sectors in Pakistan.

Results of cross-sectional fixed-effects regressions represent that the implementing of TF measures in Pakistan and trading partner countries, reduces the 7 percent of agricultural trade costs in Pakistan. Results also shows that the implementation of agricultural TF in regional trading partner countries is significantly reduces the 4 percent agricultural trade costs of Pakistan. While 10 percent implementation of agricultural TF in other trading partners, significantly reduces 3 percent agricultural trade costs. These results indicate that more implications of agricultural TF measures, in regional partner territories have a larger impact in reducing costs of trade. Therefore, trade policy makers need to put efforts into fully implementing the WTO-TFA measures, for reducing the higher trade costs in agriculture sectors, particularly with regional trading partner countries.

This research is organized as follow. Section 2 represents the overview of the significance of trade costs in agriculture sector of Pakistan. Section 3 explains the policy and other key factors of agricultural trade costs. Section 4 describes the agriculture trade costs' empirical model, and data descriptions. Section 5 shows the outcomes of empirical assessment for costs models of trade. Section 6 presents the conclusion and way forwards for Pakistan.

2. Overview of Trends in Trade Costs of both Sectors in Pakistan

The trade balance is a measure to reflect the competitive strength of a country. The sustainable trade balance for international trade is not only relying on capacity to generate/ produce, the capability to contribute into global market also play a vital role. In the world of increasing networking and globalization, developing countries are less participating in international markets. Since larger costs of trade policy barriers are faced by exporters and importers in these countries. That is one main reason behind the limited global market access and larger trade

deficit for emerging countries. For instance, during the last two decades, Pakistan’s trade deficit is increasing in the wake of rising imports against the lesser exports in the global market. According to the World Bank database, the overall trade deficit has risen sharply and stood at 10.20% (as a percentage of GDP) in 2019, while it was 1.12% in 2000.

Pakistan’s economy is believed to have enormous potential for increasing its trade. At present, this potential remains untapped owing to presence of greater trade costs of policy barriers. The beneficial effect of free trade as opposed to Pakistan’s economy. Even after its liberalization of trade through several bilateral, unilateral, regional, and multilateral agreements. One of the main reasons is limited tariff reductions and the remaining higher costs of non-tariff barriers (Noureen and Mahmood, 2022). Even though exports of agricultural raw materials have declined, it still creates substantial livelihoods for the large population. Therefore, it is important to reduce the higher costs of trade policy barriers to maximize the export potential and sustainable export growth of the agriculture sector in Pakistan.

Figure 1 presents the trend in agricultural trade costs on average are decreasing between 2003 to 2019. It remains higher for Pakistan’s economy relative to world, developed and regional trading partner states, on average almost 367 percent of tariff equivalent with a slowly decreasing rate. The presence of higher trade costs confirms the existence of larger trade policy barriers in this sector. And instantaneously abolish the competitive edge of trade in the agriculture sector of Pakistan. Figure 1 also shows that after signing the WTO TFA in 2015, the trend of agricultural trade costs become decreasing in Pakistan. This declining trend of agricultural trade costs suggested the more implementation of WTO TFA in this sector for further reduction of trade costs at the border for perishable commodities in Pakistan.

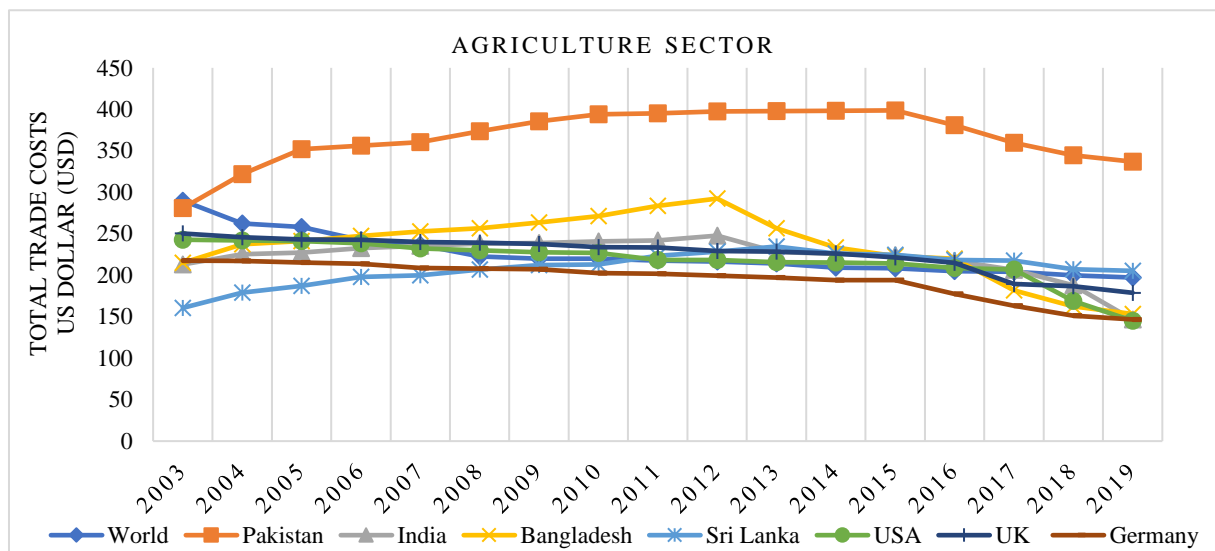


Figure 1. Trends in Global Total Trade Costs Equivalents for Agriculture sector, 2003-2019

Source: Authors’ calculations by using the data of ESCAP-World Bank.

The declining rate of trade costs is mainly unfavorable to emerging countries. It is more rapidly decreasing (owing to full implementation of WTO-TF measures) in developed countries and the world than in developing countries. It serves to increase the relative isolation of developing countries from the world market. Therefore, it is essential to reduce the costs of trade policy barriers in the international market in agriculture sector. Thus, to understand the pattern of bilateral trade costs, this research estimates the trends of agriculture sectors' trade costs facing exporters and importers with developed and regional trading partner countries.

2.1. Bilateral Trade costs in Agriculture Sectors of Pakistan with its Regional and other Major Trading Partners

The agriculture sector is linked/ related to all other sectors directly and indirectly. It plays the greater and important role for sustainable export growth in the trade balance of a country. Improving agricultural productivity and promoting sustainable agricultural trade, is a more pressing concern in developing countries. Like instead of the greater share of the agriculture sector in the GDP of Pakistan, it is the sector of an internal set of constraints. And

not be able to compete with the larger protected regional partner countries' agriculture sector. The production of perishable fruits and vegetables has been badly hit by cheaper imports and wiped out the local agriculture producers (Chand and Saxena, 2017).

In a comparison of agricultural trade costs in tariff equivalent terms, Pakistan has the higher trade costs with developed trading partners countries (Figure 2). While with regional trading partner countries the level of trade costs is less but then with increasing trend. There are several determinants/ reasons in the wake of these lesser costs of trade between Pakistan and regional trade partner countries. These include geographical proximity, cultural linkage, and fewer transportation costs because of small distance, etc.

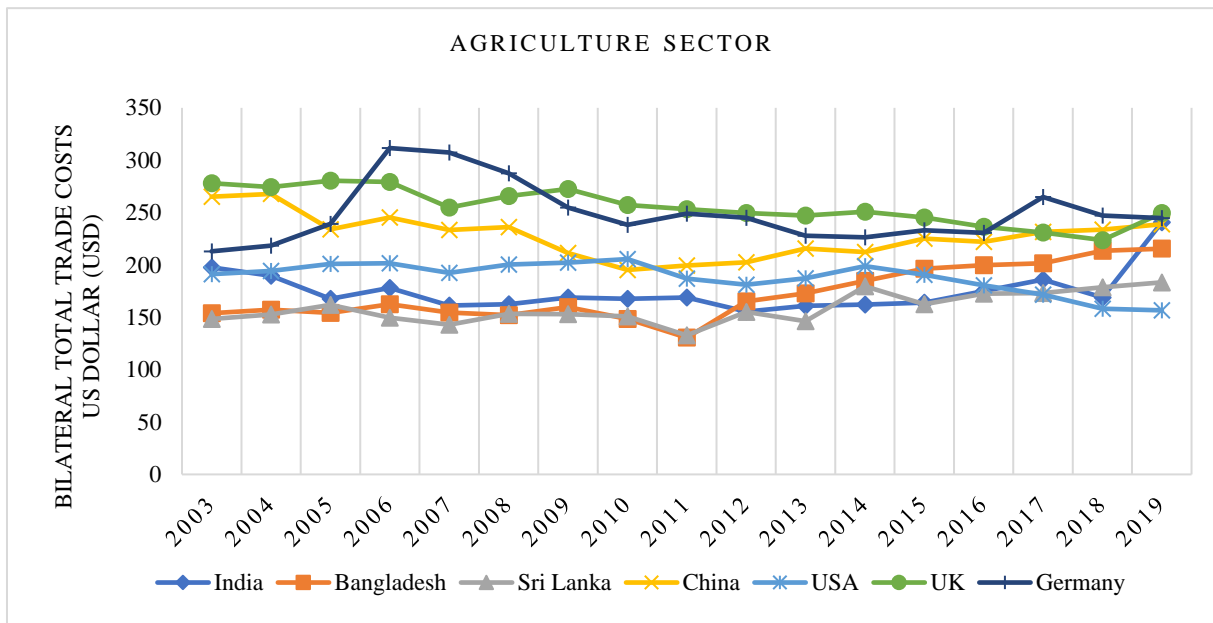


Figure 2. Trends of Pakistan's Bilateral Total Trade Costs Equivalents for Agricultural Sector with Major Trading Partners

Source: Authors' calculations by using the data of ESCAP-World Bank.

These findings also represent that Pakistan's agriculture sector has the increasing trends of bilateral trade costs with regional trading partner countries. This leads to less export share of Pakistan to them with a decreasing rate over the years, even after the successful completion of the trade liberalization process (Figure 3).

The export share to developed partner countries (like the USA, Germany, and the UK) is larger with the increasing trend (Figure 3). Pakistan prefers to export the developed partner countries because they fully implemented WTO TFA measures, which makes trade at the border with them easier as compared to trade with regional trading partner countries. More other reasons for greater export share to developed partner countries are the Multi-Fiber Arrangement, and GSP (generalized system of preferences)³ Plus status. World Bank, data represents that a larger import share in the economy of Pakistan comes from China and developed countries instead of regional trading partner countries. Pakistan's economy can increase its trade flow with them by decreasing/lowering the higher trade costs, particularly in the agriculture sector.

³ The GSP is a system providing special relief on tariffs from common rate/rules of WTO.

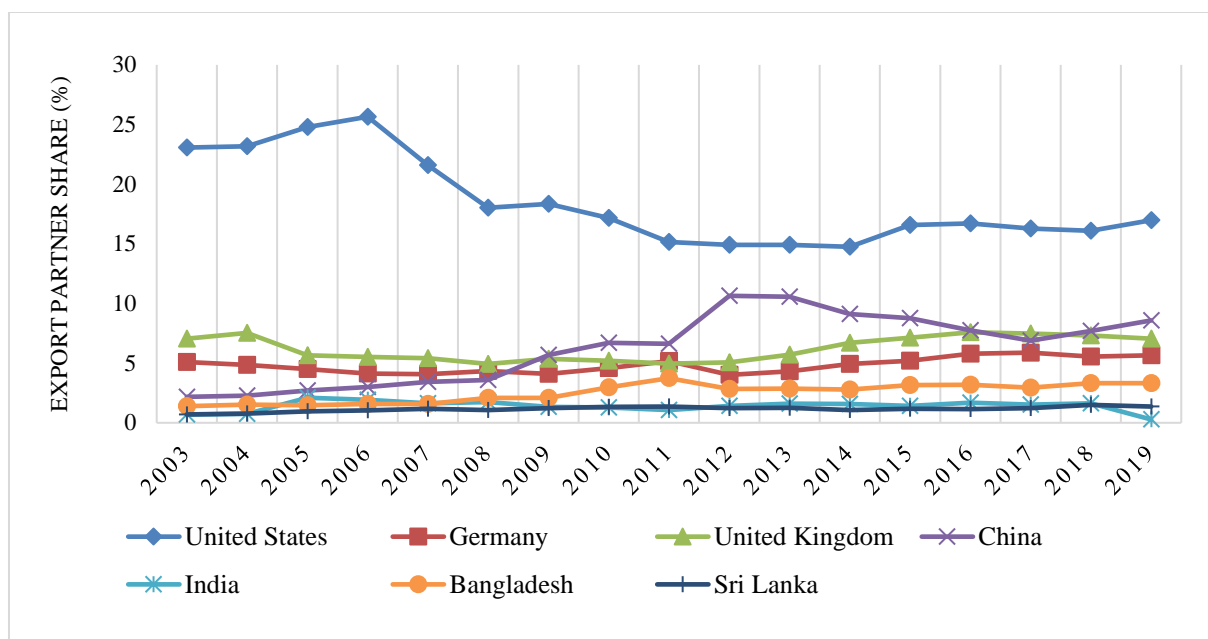


Figure 3. Trends of Pakistan’s Exports Partner Share between 2003 and 2019

Source: Authors’ calculations by using the data of WITS.

China has occurred as Pakistan’s second major export destination after 2011 (Figure 3). Likewise, in current year the largest trade deficit of Pakistan was also noted in trade with China (GoP, 2019). Presently, the China-Pakistan Economic Corridor (CPEC) is being considered to develop the network of roads and railways. The objective was to reduce supply-side constraints in the favor of Pakistan especially for agricultural goods. Instead, Pakistan is exporting only \$ 1.46 billion worth of agricultural products to China (Abbas and Ali, 2018). When implementing the China-Pakistan Free Trade Agreement (FTA) in 2007, bilateral trade increased. According to China’s statistics, export of Pakistan to China were the US \$2.47 billion and imports from China were US \$16.48 billion in 2015. Pakistan’s exports to China could not gain and remain unutilized due to the persistent higher trade costs (Figure 2).

The investigation of trends on agricultural trade costs across time and partner countries shows the significance of trade policy barriers in affecting trade costs of this sector. Developed trading partner countries are not preferred with the same/terrestrial distance, but trade policies with them are facilitating trade instead of restricting. Pakistan needs to give priority to the full implementation of WTO TFA, to reduce the higher costs of agriculture sector. Regional trading partner countries follow a restrictive trade regime with Pakistan, especially in the agriculture sector. This is one of the main causes of higher trade costs.

The government of Pakistan’s intervention has been fairly limited in the agriculture sector. On the other hand, regional trading partners’ agriculture sector has been receiving significant support from their government. This support comes in the form of direct subsidies, cheap formal credit, support prices and a higher degree of agricultural protection, etc. Higher trade costs with them indicate that historically, restrictive policies have been extremely protectionist. The trade costs of this restrictiveness exist in shape of the trade policy (tariff and non-tariff) obstacles. An appropriate way to understand trade costs at the sectoral level, this study estimates the trends of costs associated with policy (tariff and non-tariff) barriers of both sectors.

3. Policy and other key Factors of Higher Trade Costs in the Agriculture Sector

Largely considered four major significant elements of higher trade costs in developing countries includes, tariffs, non-tariff barriers as a policy barrier, trade procedures, transport, and logistics other key factors. Pakistan has performing efforts in reducing trade costs and contributing to global market for enhancing the export growth by the reforms of bilateral and unilateral trade policies. However, the improvement in the reduction of agricultural trade costs is slower.

3.1. Tariff Barriers

The major cause of higher asymmetric trade costs in Pakistan is the discriminatory stringent application of trade policy obstacles at the sectoral level. Tariff rates on agricultural commodities are larger in Pakistan (Aleem and Faizi, 2021). The level of agriculture sector tariff rate is particularly larger with regional trading partners countries in bilateral trade flows. Figure 4 represents a declining trend of tariff bilateral trade costs of Pakistan’s agriculture sector, but with a small fraction and remaining high. However, in comparison to regional partners, it remains high than developed partner countries.

It represents the highly protected agriculture sector in regional trading partner countries. They restrict the imports of agricultural commodities from Pakistan by imposing greater tariffs. Pakistan’s export competitiveness of this sectors faces higher costs of tariff barriers, particularly from regional trading partner countries.

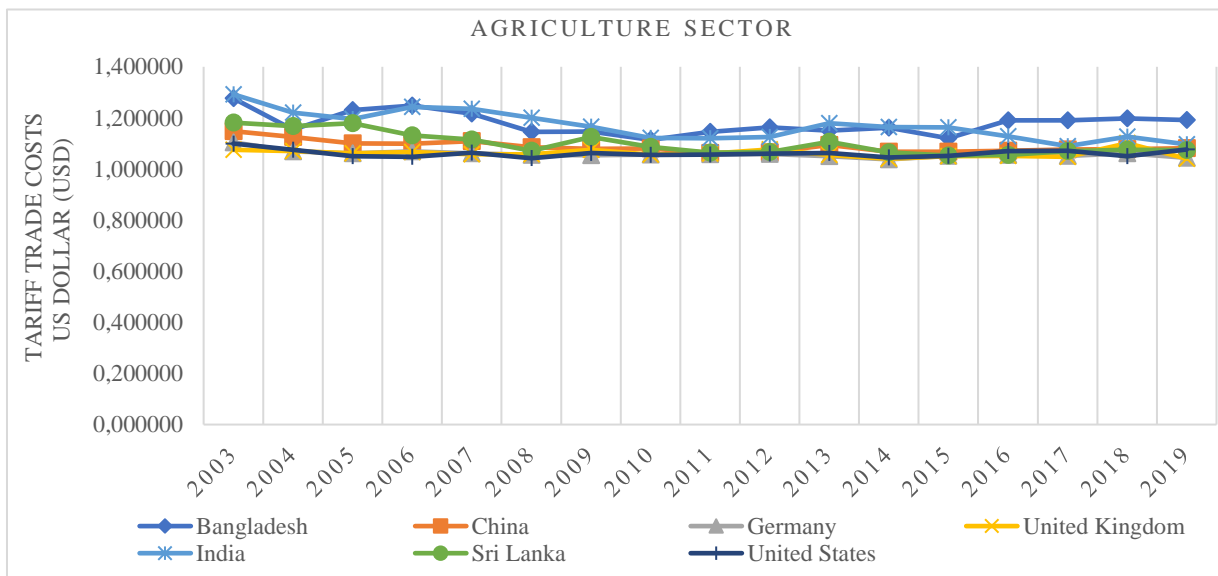


Figure 4. Trends of Bilateral Tariff Trade Costs Equivalents for Agriculture Sector of Pakistan with Major Trading Partner countries

Source: Authors’ computations by utilizing the data of ESCAP.

Instead of the progress in overall trade liberalization and tariffs reductions, Pakistan needs to put more efforts for decreasing the tariffs in the exports of agricultural goods. The indirect trade costs are correlated with non-tariff obstacles of trade policy, like the requirement of length procedure of documentation at border for agricultural goods. It shows the decreased or lower overall tariffs might be resulted in a multiplier outcome regarding the decreasing of trade costs (ESCAP, 2015).

3.2. Non-Tariff Barriers (NTBs)

Likewise, the costs of tariff obstacles, there are several other indirect elements/ determinants impede the growth of export flow, considering the NTBs, difficulties during the trade procedure at border, including the natural barriers of costs such as distance between trading partner countries. ESCAP (2015) showed that policy-related factors of trade costs in the agriculture sector, like NTBs, accounted for 59.6 to 89.8 percent of overall costs of trade in developing countries. For agriculture commodities, NTBs, like sanitary and phytosanitary (SPS) and technical barriers to trade (TBT), produce significant larger costs.

Regarding Pakistan, trade costs of NTBs are a key constraint for competitiveness and export growth. Trading partner countries induce substantial trade costs by way of strong NTBs, heightened SPS, TBT measures and visa restrictions. Figure 5 illustrates the increasing trend of trade costs of non-tariff barriers for the agriculture sector of Pakistan. In addition, it remains high in the case of developed partner countries and China than other regional partner countries. In the way of trade with regional partner countries, the key challenges exporters from Pakistan face, include heavy import duties, regulatory and safety requirements, lack of appropriate storage facilities, port

restrictions, lengthy customary procedures, obstacles in monetary transaction, absence of telecommunication facilities, poor and abysmal transport and logistics and infrastructure, etc.

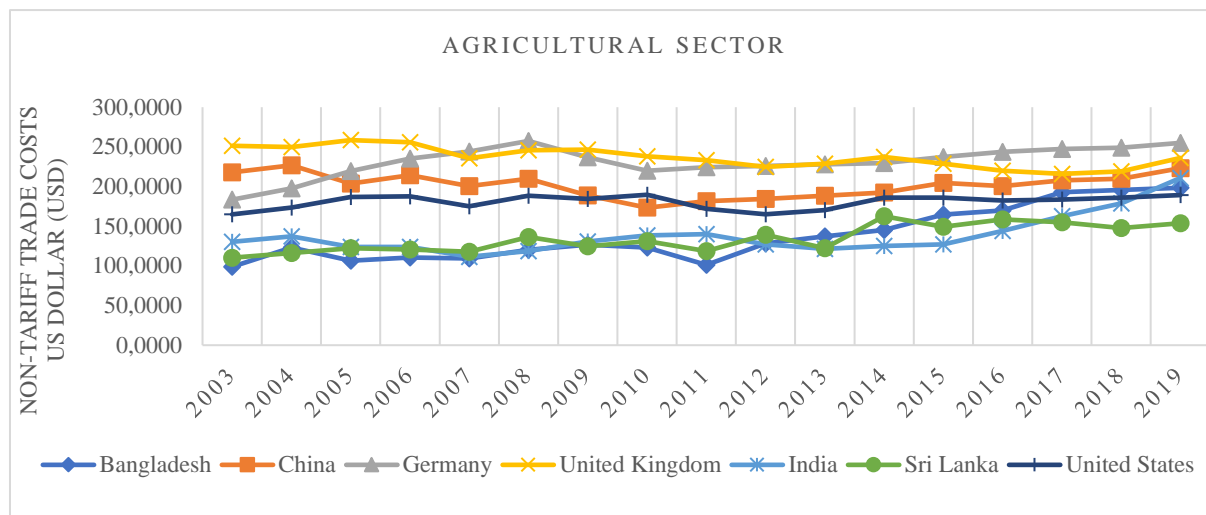


Figure 5. Trends of Bilateral Non-Tariff Trade Costs Equivalents for Agriculture Sector of Pakistan with Major Trading Partner countries

Source: Authors calculations by using the data of ESCAP-World Bank.

This research indicates that trade costs associated with NTBs for agriculture sectors' commodities are high with increasing trends. Trade of agricultural commodities face more regulatory challenges and constrains of NTBs relative to other sectors (Hoekman and Nicita, 2008). Aleem and Faizi (2021) also found that NTBs of trade for the economy of Pakistan, rise from 1 percent in 2003 to 55 percent in 2015. Due to the presence of larger amount of NTBs related to SPS/TBT measures in agriculture sector, there are the highest costs of trade for agricultural goods (Cadot and Gourdon, 2015). The report of Asia- Pacific in 2017 related to trade and investment also suggested for reducing the NTBs is an important tool for achieving sustainable export growth of the agricultural sector in developing countries.⁴

So, trade costs of NTBs are considered the important policy factor from the perspective of a country's capability to share in global markets. The limited success and smaller gains of Pakistan's economy to liberalize its trade, represent the presence of higher trade costs. Pakistan can still export a huge amount of agriculture sector's commodities. However, the costs of NTBs for the agriculture sector are significantly larger. It exemplifies a sectoral ineffectiveness and biasness in trade policies. There is a need of research for identifying the different factors of trade costs and suggest the trade policies to reduce these costs for sustainable export growth over a longer period at the sectoral level.

3.3. The Costs of Trade Processes

A substantial and major element of trade costs at the border is the slow trade processes due to documentation or lengthy procedure. The data on trade procedure is updated on yearly basis provides by the report of Ease of Doing. The report documents the data on costs and time linked with the exports and imports of goods during the logistical process. However, the data by itself is not required/ essentially for trading costs of agricultural commodities, it shows a standard or basic information to understand the agricultural costs of trade.

Table 1 shows the data on costs and time involved at border for compliance and documentation fluctuate significantly. In advanced countries the costs for compliance at border is greater relative to documentation costs. In the case of developing countries documentation costs are higher. The advanced countries record the less costs associated with time for trade at border than developing countries with greater trade across borders score. In developing countries, the major cause of higher trade costs for the agriculture sector is the costs of time requirement at the border and for processing the documents (Table 1). Liapis (2011) estimated that a reduction in exporting

⁴ See in Chapter 4 for detail.

time costs is associated with 10 percent rise in agriculture goods trade. Similarly, 10 percent reduction in import costs of time enhanced the 22 percent of agricultural commodities trade. Hummels *et al.* (2007) also discovered that time delays lead to higher trade costs at each step of the trade procedures.

Table 1. Time and costs of trading across borders, 2019

| Year (2019) | Trade Across Border Score | Required time of trade documentary compliance (hours) | Required time of trade: Compliance (hours) | Cost to trade: Documentary Compliance (USD) | Cost to trade: Border Compliance (USD) |
|-------------|---------------------------|---|--|---|--|
| USA | 92 | 9 | 3 | 160 | 350 |
| UK | 93.8 | 6 | 27 | 25 | 280 |
| Germany | 91.8 | 2 | 36 | 45 | 345 |
| China | 86.5 | 192 | 56 | 157 | 172 |
| India | 82.5 | 32 | 117 | 156 | 173 |
| Pakistan | 68.8 | 151 | 178 | 178 | 248 |
| Bangladesh | 31.8 | 291 | 384 | 595 | 1308 |

Source: ESCAP

The higher costs of transporting goods to the border at each step of the trade procedures indicate that agricultural goods face greater costs (Table 1). In the same line, Moise and Le (2013) argued that larger physical inspections, clearance of custom taxes, load up of the shipment, and SPS requirements lead to delays at the border and cause higher trade costs for agricultural products. A lower score of trade for developing countries indicates more potential for them to participate in the global market. By reducing the costs at the border mainly for agricultural goods. One of the main reasons behind lower trade costs for upper-middle and high income of world trade organization (WTO) member countries is the more implementation of TFA.

The primary goal of WTO-TFA is to reduce higher trade costs at borders by making trade across borders faster, cheaper, simplifying the formalities, procedures, documents, and exchange of information in the supply chain. Therefore, facilitation in the progress of agricultural commodities across borders become efficient because of adopting TFA, trade procedure at the border become efficient. ESCAP (2018) also indicate that to streamline trade procedures by implementing the WTO-TFA developed countries, have a less and faster-declining rate of trade costs in the agricultural sector. The WTO-TFA is supposed to decrease/ cut the trade costs for low-income economies greater than 14 percent, for developing countries, it is expected to reduce costs by almost 15 percent and for upper-middle economies, this reduction of costs is expected to nearly 13 percent. The lesser implementation score of TWO-TFA represents the main cause of higher trade costs in Pakistan in comparison to developed and regional trade partner countries (Table 2).

Table 2. Overall Implementation of Trade Facilitation Score

| Year | Developed countries | South Asia | China | India | Bangladesh | (Percentage) | |
|------|---------------------|------------|-------|-------|------------|--------------|----------|
| | | | | | | Sri Lanka | Pakistan |
| 2015 | 69.38 | 35.08 | 78.49 | 63.44 | 31.18 | 43.01 | 40.86 |
| 2017 | 75.40 | 39.52 | 82.8 | 67.74 | 35.48 | 48.39 | 49.46 |
| 2019 | 78.34 | 48.39 | 82.8 | 78.49 | 52.69 | 51.61 | 58.06 |
| 2021 | 81.86 | 58.47 | 91.4 | 90.32 | 64.52 | 60.22 | 58.06 |

Source: ESCAP data established by UN Survey.

Table 3 shows the TF measures and their implementing rate specific to agriculture sector for cross border trade, in the economy of Pakistan. Cross-border paperless trade measures, laws, and regulations for electronic transactions are highly applied with the rate of 69.7 percent in developing countries (ESCAP, 2019). While in Pakistan it is partially implemented. And the electronic exchange of sanitary and Phyto-Sanitary certificates are not applied. This represents the main cause of higher trade costs particularly for agricultural goods of NTBs at the border for the Pakistan economy (Table 3).

Table 3. Status for the Implementing of TF Rates in Agriculture Sector of Pakistan (2021)

| 1. Paperless TF rates during the cross border | |
|--|-----------------------|
| Laws and regulations for electronic transactions | Partially implemented |
| Recognized certification authority | Not implemented |
| Electronic exchange of Customs Declaration | Partially implemented |
| Electronic exchange of Certificate of Origin | Not implemented |
| Electronic exchange of Sanitary & Phyto-Sanitary Certificate | Not implemented |
| Paperless collection of payment from a documentary letter of credit | Not implemented |
| 2. Trade facilitation and agricultural trade | |
| Testing and laboratory facilities available to meet SPS of main trading partners | Partially implemented |
| National standards and accreditation bodies to facilitate compliance with SPS | Fully implemented |
| Electronic application and issuance of SPS certificates | Not implemented |
| Special treatment for perishable goods | Partially implemented |

Source: ESCAP data established by UN Survey 2021.

Including TF and measures for agriculture sector, testing and laboratory resources/ facilitations with sanitary and phytosanitary (SPS) standards are less implemented in developing countries mostly 38 percent (ESCAP, 2019). In the case of Pakistan's economy, it is partially implemented with the special treatment for perishable goods (Table 3). Pakistan's economy needs full implementation of TF and measures for agricultural sector particularly for reducing higher trade costs in this sector.

3.4. Transportation and logistics performing

Transportation play a crucial/significant role during trade in global market. The growth and improvement in the process of maritime and air gateways have the capacity to change or reduce the costs of trade during the transactions of commodities across borders. Particularly agricultural commodities needs effective logistics due to their temperature and time sensitive nature. Pakistan lost 30 percent of agricultural products in 2010, due to lack of storage facilitation and inefficient transport infrastructure, make a record of economic cost almost USD 12.9 billion (IFC, 2011). The regional performance on trade logistics, South Asia was lower than the overall Asia-Pacific (ESCAP, 2019). These countries needs a considerable development in their logistic performance as it is far away behind the advanced and other Asia regional partner countries.

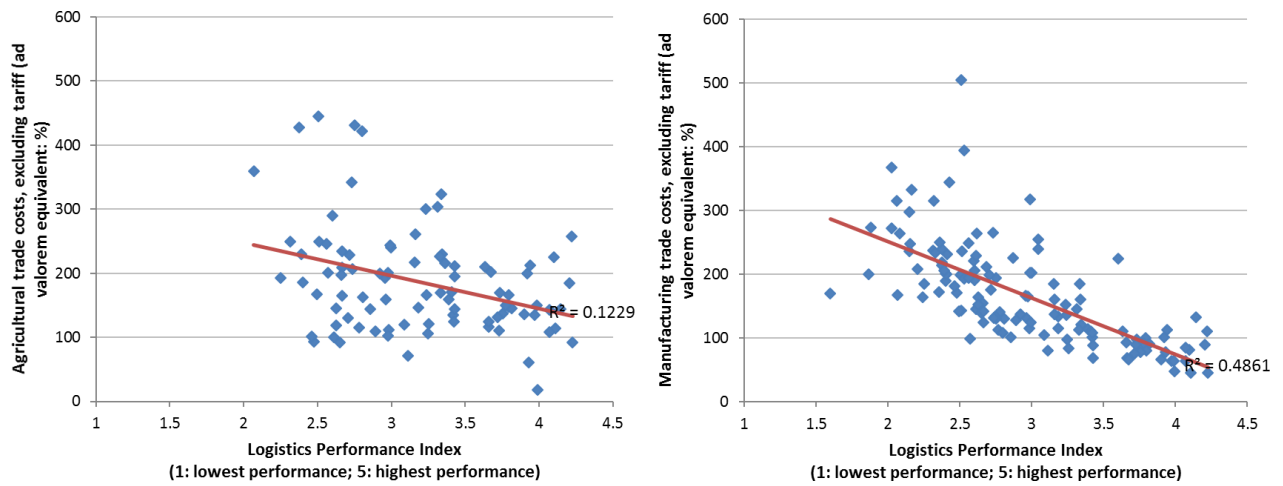


Figure 6. Scatterplot for Sectoral Trade Costs and Logistics Performance Index for the Economy of Pakistan

Source: Authors' estimate established on Logistics Performance Index, 2019 and costs of trade omitting tariff with trading partners of Pakistan, taking average during 2003-2019.

Figure 6 shows a negative association between performance of logistics and trade costs for Pakistan's economy. The smaller logistics performance index value is linked with greater trade costs. The different slope in two panels suggest that distinct elasticities of trade costs and logistic performance. Figure 6 shows to improve in logistic is greater decline in manufacturing sector trade costs as compared to agriculture sector. In the form of descriptive control, manufacturing sector costs have a stronger link with logistic performance as compared to agriculture sector costs of trade (determined by R^2).

There is significant room for improvement of transport facilities in Pakistan's economy at the sectoral level. Performance of trade logistics is significant to assess the functioning of commodities flow across countries and world market by using the way of cross border transportation and connectivity. Therefore, logistics performing is essential in ensuring effective participation at the sectoral level in the global market.

These four main elements of agriculture sector trade costs are significantly constrained, Pakistan's economy to participate in the international export market. Agricultural products are used as significant input during the process of food preparation in different industries and sectors. Therefore, TF for agriculture sector can promote the growth of export in total trade. These continuous TF particularly for agriculture sector can reduce the higher costs of trade for this sector and make greater advantages to the export growth of this sector.

4. Methodology

4.1. Empirical Model

To measure the impact of trade cost components and application of TF measures in bilateral trade costs for agriculture sector, this section shows the empirical model. The study used cross-sectional data for Pakistan's bilateral trade costs at the sectoral level with the average value of 2015-2019. The trading partners were included in the estimation for whom data of trade cost for agriculture sector can be measured. By following the Arvis *et al.*, 2013, the agricultural trade cost model is given as follow:

$$\ln ATC_{Pakj} = \beta_0 + \beta_1 \ln Dis_{Pakj} + \beta_2 \ln Contig_{Pakj} + \beta_3 \ln Commlang_of_{Pakj} + \beta_4 \ln Lsci_{Pakj} + \beta_5 \ln NTB_{Pakj} + \beta_6 \ln TF_{Pakj} + d_{Pak} + d_j + \varepsilon_{Pakj} \quad \dots (6)$$

where β 's are parameters of the model, Pak and j representing the Pakistan and trading partner country, ATC_{Pakj} is Pakistan's bilateral agricultural trade costs, dis indicate the distance, Contig is contiguity, Commlang_off is a common language, Lsci is the liner shipping connectivity index, NTBs are non-tariff barriers, TF are trade facilitation measures for the agricultural sector, d_{Pak} and d_j are fixed-effects dummy variables incorporated to control for cross-country heterogeneity and to enhance the efficiency of estimated model. ε_{Pakj} is the idiosyncratic

disturbance error term. The empirical model is assessed by using the ordinary least squares method around a cross-section of 95 trading partner states.

Table 4: Data Description

| Variable | Explanation of the variable | Data Treatment | Data Source | Expected Signs |
|--|---|--------------------------------|--|----------------|
| ATC_{pak_j} | Bilateral trade costs of Pakistan's agricultural sector with trading partner j . | The average value of 2015-2019 | ESCAP | N/A |
| $Dist_{pak_j}$ | The geographical distance between Pakistan and partner country j . | N/A | CEPII | + |
| $Contig_{pak_j}$ | 1 if Pakistan and partner country j share a same border and 0 if not. | N/A | CEPII | - |
| $Comlang_{Off_{Pak_j}}$ | 1 if Pakistan and Partner country j have the same formal foreign language and 0 if not. | N/A | CEPII | - |
| RTA_{Pak_j} | 1 if Pakistan and partner country is member of the same region and trade agreement if not then 0. | N/A | WTO Regional Agreement | - Trade |
| $LSCI_{Pak_j}$ | The geometric average value of index(liner shipping connectivity) Pakistan and partner j . | The average value of 2015-2019 | UNCTAD | - |
| $TFreg_{TF_j}$ and TF_{Pak_j} for Agriculture Sector | The geometric average of agricultural-related trade facilitation in regional and other trading partner country j . ⁵ | The average value of 2015-2019 | A Global Survey for Trade Facilitation and Paperless Trade Implementation. | - |
| $dum_NTBs_pak_j$ | Dummy variable of NTBs it is 1 if the geometric average of Pakistan and j is greater than the average value of NTBs, and 0 if not. ⁶ | N/A | Integrated Trade Intelligence Portal (I-TIP) | + |

⁵ Execution rate is estimated for every state by adding the execution of four questions related to agriculture sector TF and dividing them by twelve (these question number of survey are 29, 43,44 and 45) . Coding/ Scoring of different stages of implementation table will provide at demand.

⁶ The NTBs incorporated the SPS, export subsidies, tariff rate quota, TBT, and special safeguard. The mean value of NTBs related to agriculture sector in this research is 37 for each state. So, in all nations, on average, implement rate of NTBs is 37 for other trading partner countries. Note: Statistics filling for LSCI is needed to make sure the addition of landlocked countries. The average port economies those can be adjacent to that of landlocked economies are used as a proxy for landlocked economies' portal performing.

4.2. Regression Results for Cross-Sectional Fixed Effects Regressions

The outcomes of econometric estimate are presented to capture the impact of policy and other key factors on agricultural trade costs. It also represents the impact of WTO-TFA for reducing these costs by incorporating agriculture trade facilitation (TF) measures. Estimated results of cross-sectional fixed effects are shown in Table 5.

Table 5: Results of the impact of policy and other key factors on bilateral agricultural trade costs of Pakistan.

| Variable | (1) TF of agri with all trading partner countries | (2) NTBs, TF to agri and regional partners | (3) TF to agri with all trading partners and NTBs | (4) Interaction term for TF to agri with all trading partner and NTBs |
|-------------------|--|---|--|--|
| In_dist | 0.326*** [22.15] | 0.330*** [30.05] | 0.325*** [22.14] | 0.331*** [22.18] |
| Contig | -0.372*** [-11.952] | -0.371*** [-13.94] | -0.373*** [-11.812] | -0.374*** [-11.828] |
| RTA_pakj | -0.160*** [-7.898] | -0.159*** [-9.773] | -0.156*** [-9.045] | -0.157*** [-9.335] |
| Comlang_off | -0.122*** [-6.723] | -0.124*** [-9.740] | -0.123*** [-6.901] | -0.121*** [-6.857] |
| In_LSCI_pakj | -0.336*** [-6.665] | -0.343*** [-2.535] | -0.338*** [-6.734] | -0.341*** [-6.779] |
| TFagri_pakj | -0.687*** [-3.654] | | -0.588*** [-3.657] | -0.586** [-2.408] |
| TFagri_region | | -0.411*** [-3.262] | | |
| TFagri_j | | -0.321*** [-4.773] | | |
| dum_NTBs_pakj | | 0.388*** [2.152] | 0.391*** [3.659] | 0.397*** [4.574] |
| int_tfntb_pakj | | | | -0.159** [-2.172] |
| R-square | 0.716 | 0.723 | 0.731 | 0.744 |
| Adjusted R-square | 0.713 | 0.718 | 0.727 | 0.739 |

Note: *** 10 percent, ** 5 percent, *1 percent and square bracket indicates the t-values. Country specific/ individual fixed effects are used in all estimated model and statistically are equally significant.

In all estimated models the included determinants of trade costs for agriculture sector have the required signs. Absence of a same border and larger distance between trade partners leads to enhance/raise the significantly costs

for agricultural commodities. Results indicate that natural factors of costs (i.e., factors of trade costs those have not change over time due to trade policy) are significantly related and have a huge impact. Having a same official language is significantly correlated with smaller rate of agricultural costs off trade through all trading partner states.

Agriculture sector TF are constantly significant within policy factor of all models. In models (1), (3) and (4) implementing the agricultural TF measures in Pakistan and trading partner countries reduces the agricultural trade costs of Pakistan by 7 percent. Model (2) shows the 10 percent implementation of agricultural TF in the South Asia region is significantly reduces the 4 percent agricultural trade costs. While 10 percent implementation of agricultural TF in other trading partners, significantly reduces 3 percent agricultural trade costs. These results indicate that more implications of agricultural TF measures, in South Asia regional partner states have a larger impact in reducing the agricultural costs of trade.

In addition to other policy factor, liner shipping connectivity is observed to be negatively and significantly correlated with agricultural costs of trade. Such as 10 percent improvement in liner shipping connectivity leads to decrease the total agricultural costs of trade around 3 percent in all models. It shows the significance of logistics and transport infrastructure development in reducing the agricultural trade costs for the economy of Pakistan. It also suggested the agricultural programs should include both soft and hard infrastructures. Latest technology for information and communication is required for implementing the soft infrastructure in agriculture TF. For that policymakers can use or avail the latest framework agreement on digital trade facility in Asia and Pacific.⁷

All models represents a negative and statistically significant impact of regional trade agreement for agricultural trade costs. Results suggest that a 10 percent rise in a regional trade agreement is expected to reduce almost 2 percent agricultural trade costs of Pakistan. The positive effect of NTBs is statistically significant for agricultural trade costs. A 10 percent higher rate of NTBs implemented is linked with an increased rate of nearly 4 percent in agricultural trade costs. The interaction term between agriculture TF measures and NTBs in the model (4) is also significant. It represents a solid effect of NTBs on the agricultural costs of trade in Pakistan.

Policymakers need to identify NTBs at micro-level investigations for agricultural goods' trade across borders and reduce their huge costs in this sector. These outcomes verify that TF measures need to be functional and sector-specific, or policy modifications must go ahead of common agreements of trade on costs reduction. All model results suggest that implementing the full TF measures in agriculture sector is essential for effectively reducing the agricultural trade costs in Pakistan. Policymakers need to focus on looking at the full implementation of TF measures in the agriculture sector along with the improvement in maritime connectivity.

5. Conclusion and Policy Recommendations

The sustainable export growth of the agriculture sector is essential for reducing the higher trade costs, particularly in developing countries. This research investigates trends of agricultural trade costs and finds whether developing economies, like Pakistan, had huge or lesser costs in contrast to the world, regional, and other trading partner states. In addition, it investigates the trends in agricultural costs related with different policies and other key factors that drive them up. The empirical model further examines the impacts of policy, and other key factors on bilateral trade costs, by using cross-sectional data for 95 trading partner countries of Pakistan.

Empirical outcomes indicate that in contrast to other countries of world, Pakistan has faced the highest total trade costs in agriculture sector. These higher trade costs limit the sustainable export growth of this sector and lead to high trade deficit of Pakistan. Worldwide estimates show that trade costs of agriculture sector have a decreasing trend. In the case of Pakistan, it remains relatively high but with a slowly declining trend. The findings also confirm the presence of relatively greater trade costs on account of non-tariff obstacles as compared to the trade costs due to tariffs in agriculture sector. Furthermore, Pakistan's trade cost owing to tariffs remains higher with its regional trading partners in agriculture sectors, which is one of the main factors adversely affecting competitiveness, and hence growth in exports.

The empirical results represent that all-natural trade cost factors have a substantial and greater effect on agricultural trade costs with expected signs in all models. The agricultural trade costs model confirms that the implementation of trade facilitation is a key policy tool to decrease the trade costs of this sector. Full implementation of TF measures under WTO-TFA, particularly linked to the agriculture sector is correlated with a 7 percent reduction in

⁷ <http://www.unescap.org/resources/framework-agreement-facilitation-cross-border-paperless-trade-asia-andpacific>.

agricultural trade costs. Results also explicate greater reduction in agricultural trade costs by the full implementation of TF measures in regional trading partner countries than other trading partners.

Therefore, Policymakers need to coordinate the efforts with regional trading partner countries in reducing agricultural trade costs by fully implementing the WTO-TFA measures and simplifying the trade processes at the border.

References

- Aleem, I., & Faizi, B. (2021). *Non-tariff Measures, Overall Protection, and Export Competitiveness: Evidence from Pakistan and Regional Countries* (No. 2021: 2). Pakistan Institute of Development Economics.
- Cadot, O., & Gourdon, J. (2015). NTMs, preferential trade agreements, and prices: new evidence. CEPII Working Paper No. 2015-01. Paris: Centre d'Etudes Prospectives et d'Informations Internationales.
- Chand, R., & Saxena, R. (2017). Agricultural trade between India and Pakistan: status and potential. In *India-Pakistan Trade Normalisation* (pp. 15-59). Springer, Singapore.
- Engman, M. (2005). The Economic Impact of Trade Facilitation. OECD Trade Policy Working Paper
- ESCAP, UN. (2015). Implementation of the WTO trade facilitation agreement in the Asia Pacific region: analysis of category a submission.
- ESCAP, UN. (2018). Trade facilitation and paperless trade implementation in Asia-Pacific countries with special needs.
- Fang, C., & Beghin, J. C. (2017). Protection and comparative advantage of chinese agriculture: implications for regional and national specialization. In *Agricultural Trade and Policy in China* (pp. 175-204). Routledge.
- GoP (2019). "Pakistan Economic Survey". Finance Division, Government of Pakistan.
- Hoekman, B., & Nicita, A. (2011). Trade policy, trade costs, and developing country trade. *World Development*, 39(12), 2069-2079.
- Hummels, D., Minor, P., Reisman, M., & Endean, E. (2007). Calculating tariff equivalents for time in trade. *USAID Report, March*.
- Liapis, P. (2011). *Changing patterns of trade in processed agricultural products* (No. 47). OECD Publishing.
- Mahmood, Z., Altaf, S., & Noureen, S. (2017). Trade Costs of Pakistan with its Major Trading Partners: Measurement and its Determinants. *NUST Journal of Social Sciences and Humanities*, 3(2), 232-264.
- Moise, E., & Le Bris, F. (2013). Trade Costs-What Have We Learned?: A Synthesis Report. No.21. Paris: Organisation for Economic Cooperation and Development (OECD).
- Noureen, S., & Mahmood, Z. (2022). The Effects of Trade Cost Components and Uncertainty of Time Delay on Bilateral Export Growth. *Heliyon*, e08779.
- Stone, S., & Casalini, F. (2020). Sanitary and phytosanitary measures. *Handbook of Deep Trade Agreements*, 367.